CBM MATE NODE 1 NADIR

OBJECTIVE:
Mate PMA 3 to Node 1 Nadir port using Common Berthing Mechanism (CBM)

LOCATION:
NOD1/AFD EPCS

DURATION:
TBD

REFERENCED PROCEDURE(S):
None

<table>
<tr><td style="background-color:red;color:white;text-align:center">WARNING</td></tr>
<tr><td>To prevent damage to Active CBM (ACBM), free drift thruster inhibit is required from initiation of CBM capture latch operation until eight bolts reach tensile load of 6672 N/1500 lbs. SRMS shall remain grappled to PMA 3 until such time.</td></tr>
</table>

1. VERIFY PRIMARY AND SECONDARY RPCs CLOSED

PCS   Node 1: S&M: Nadir CBM

    | Node 1 Nadir CBM Display |

    'RPCM N13B B Primary Power'

    √RPC Posn (four) - Cl

    | Node 1 Nadir CBM Display |
    'RPCM N14B B Secondary Power'

    √RPC Posn (four) - Cl

2. VERIFY CBM STATUS

    | Node 1 Nadir CBM Display |
    'CBM Status'

    √Mode - Activated
    √Master - Secondary
    √Comm Error - No X
    √Master Cmd Status - Complete

3. <u>VERIFY READY TO LATCH INDICATORS (RTLs) CLOSED</u>

> <div align="center">NOTE</div>
> 1. Step 3 is performed following SRMS translation of the PMA 3 into the CBM capture envelope.
>
> 2. Capture sequence may be initiated with three of four RTLs closed. In this case, the latch associated with the open RTL must be masked. The mask command for Latch X is accessed by selecting the Latch X button on the CBM depiction, selecting the Commands button from the pop-up window, and executing the Mask Latch X command.

| Node 1 Nadir CBM Display |
'Capture Latch Status'

√Posn (four): 199 --- 200

| Node 1 Nadir CBM Display |
'CBM Graphic'

√RTL (four) - green

4. <u>PERFORM FIRST STAGE CAPTURE</u>

| Node 1 Nadir CBM Display |
'Command Sets'

sel Mate

| Node 1 Nadir CBM Mate |

sel Capture First Stage

| Node 1 CBM Capture First Stage |

cmd Capture First Stage
√Confirmation Request - Capture

cmd Confirm Cmd
Wait 15 seconds.
√Master Cmd Status - Complete
√Cmd Code (four) - Capture
√Cmd Status (four) - Complete
√Posn (four): 148 --- 150

5. <u>PERFORM SECOND STAGE CAPTURE</u>

    | Node 1 Nadir CBM Mate |

    sel Capture Second Stage

    | Node 1 CBM Capture Second Stage |

    cmd Capture Second Stage
    √Confirmation Request - Capture

    cmd Confirm Cmd
     Wait 60 seconds.
    √Master Cmd Status - Complete
    √Cmd Code (four) - Capture
    √Cmd Status (four) - Complete
    √Posn (four): 6 --- 8

6. <u>ACQUIRE FIRST SET OF FOUR BOLTS</u>

    | Node 1 Nadir CBM Mate |

    sel First Four

    | Node 1 CBM Acquire First Four Bolts |

    cmd ABolts First Four
    √Confirmation Request - ABolts

    cmd Confirm Cmd
     Wait 6 minutes.
    √Master Cmd Status - Complete
    √Cmd Code (four) - ABolts
    √Cmd Status (four) - Complete
    √Load (four): 0 --- 6700

7. <u>ACQUIRE SECOND SET OF FOUR BOLTS</u>

    | Node 1 Nadir CBM Mate |

    sel Second Four

    | Node 1 CBM Acquire Second Four Bolts |

    cmd ABolts Second Four
    √Confirmation Request - ABolts

cmd Confirm Cmd
   Wait 6 minutes.
√Master Cmd Status - Complete
√Cmd Code (four) - ABolts
√Cmd Status (four) - Complete
√Load (four): 0 --- 6700

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                    NOTE
Step 8 is performed following 12 hour thermal
hold that begins with completion of step 7.
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8. ACQUIRE THIRD SET OF FOUR BOLTS

   Node 1 Nadir CBM Mate

   sel Third Four

   Node 1 CBM Acquire Third Four Bolts

   cmd ABolts Third Four
√Confirmation Request - ABolts

   cmd Confirm Cmd
   Wait 6 minutes.
√Master Cmd Status - Complete
√Cmd Code (four) - ABolts
√Cmd Status (four) - Complete
√Load (four): 0 --- 6700

9. ACQUIRE FINAL SET OF FOUR BOLTS

   Node 1 Nadir CBM Mate

   sel Last Four

   Node 1 CBM Acquire Last Four Bolts

   cmd ABolts Last Four
√Confirmation Request - ABolts

   cmd Confirm Cmd
   Wait 6 minutes.
√Master Cmd Status - Complete
√Cmd Code (four) - ABolts
√Cmd Status (four) - Complete
√Load (four): 0 --- 6700

10. PERFORM INTERMEDIATE TORQUING FIRST STAGE

Node 1 Nadir CBM Mate

sel First Stage

Node 1 CBM Intermediate Torque First Stage

cmd IBolt First Stage
√Confirmation Request - IBolt

cmd Confirm Cmd
Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 0 --- 11150

11. PERFORM INTERMEDIATE TORQUING SECOND STAGE

Node 1 Nadir CBM Mate

sel Second Stage

Node 1 CBM Intermediate Torque Second Stage

cmd IBolt Second Stage
√Confirmation Request - IBolt

cmd Confirm Cmd
Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 0 --- 15600

12. PERFORM INTERMEDIATE TORQUING THIRD STAGE

Node 1 Nadir CBM Mate

sel Third Stage

Node 1 CBM Intermediate Torque Third Stage

cmd IBolt Third Stage
√Confirmation Request - IBolt

cmd Confirm Cmd
  Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 0: --- 20050

13. <u>PERFORM INTERMEDIATE TORQUING FOURTH STAGE</u>

<u>NOTE</u>
Following Fourth Stage of the intermediate torque sequence, all
16 bolts should have preload in the range of 23400 --- 24500 N.
Otherwise, step 13 should be repeated until all 16 bolts achieve
the specified preload.

| Node 1 Nadir CBM Mate |

  sel Fourth Stage

| Node 1 CBM Intermediate Torque Fourth Stage |

cmd IBolt Fourth Stage
√Confirmation Request - IBolt

cmd Confirm Cmd
  Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 23400 --- 24500 else repeat step 13

14. <u>PERFORM INTERMEDIATE TORQUING LAST STAGE</u>

<u>NOTE</u>
Following Last Stage of the intermediate torque sequence, all
16 bolts should have preload in the range of 45650 --- 46750 N.
Otherwise, step 14 should be repeated until all 16 bolts achieve
the specified preload.

| Node 1 Nadir CBM Mate |

  sel Last Stage

| Node 1 CBM Intermediate Torque Last Stage |

cmd IBolt Last Stage
√Confirmation Request - IBolt

cmd Confirm Cmd
  Wait 2 minutes.

√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 45650 --- 46750 else repeat step 14

15. PERFORM FINAL TORQUING SEQUENCE

> **NOTE**
> Following the final torque sequence, all 16 bolts should have preload in the range of 84800 --- 85900 N. Otherwise, step 15 should be repeated until all 16 bolts achieve the specified preload.

| Node 1 Nadir CBM Mate |

sel Final Torque

| Node 1 CBM Final Torque |

cmd FBolt Nominal
√Confirmation Request - Fbolt

cmd Confirm Cmd
 Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - FBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 84800 --- 85900 else repeat step 15

16. CLOSE CAPTURE LATCHES

| Node 1 Nadir CBM Mate |

sel Close Latches

| Node 1 CBM Close Capture Latches |

cmd Close
 Wait 10 seconds.
√Confirmation Request - Close

cmd Confirm Cmd
√Master Cmd Status - Complete
√Cmd Code (four) - Close
√Cmd Status (four) - Complete
√Posn (four): 0 --- 1

17. <u>DEACTIVATE NADIR CBM MASTER CONTROLLER</u>

| Node 1 Nadir CBM Mate |

sel Deactivate Nadir CBM

| Node 1 Nadir CBM Deactivate CBM |

cmd Deactivate
Mode - Deactivated
Master - None

18. <u>OPEN PRIMARY RPCs</u>

| Node 1 Nadir CBM Mate |

sel RPC 03

| RPCM N13B B RPC 03 |

cmd Open **Execute**
√Position - Open

| Node 1 Nadir CBM Mate |

sel RPC 04

| RPCM N13B B RPC 04 |

cmd Open **Execute**
√Position - Open

| Node 1 Nadir CBM Mate |

sel RPC 05

| RPCM N13B B RPC 05 |

cmd Open **Execute**
√Position - Open

| Node 1 Nadir CBM Mate |

sel RPC 06

| RPCM N13B B RPC 06 |

cmd Open **Execute**
√Position - Open

19. OPEN SECONDARY RPCs

| Node 1 Nadir CBM Mate |

sel RPC 11

| RPCM N14B B RPC 11 |

cmd Open **Execute**
√Position - Open

| Node 1 Nadir CBM Mate |

sel RPC 12

| RPCM N14B B RPC 12 |

cmd Open **Execute**
√Position - Open

| Node 1 Nadir CBM Mate |

sel RPC 13

| RPCM N14B B RPC 13 |

cmd Open **Execute**
√Position - Open

| Node 1 Nadir CBM Mate |

sel RPC 14

| RPCM N14B B RPC 14 |

cmd Open **Execute**
√Position - Open